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Paul Hann
Central Valley Regional Water Board
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Subject: **Submittal of Written Comments on the Central Valley Pesticide Basin Plan Amendment, Water Quality Criteria, Phase II – Identification of an Existing Method(s) or Development of a New Method**

Dear Mr. Hann:

The Sacramento Regional County Sanitation District (SRCSD) appreciates the opportunity to provide written comments on the portion of the Central Valley Pesticide Basin Plan Amendment on Water Quality Criteria, Phase II – Identification of an Existing Method(s) or Development of a New Method. SRCSD is a regional sanitation district that serves over a million customers in the Sacramento metropolitan area and owns and operates the Sacramento Regional Wastewater Treatment Plant (SRWTP). The SRWTP discharges directly into the Sacramento River downstream of Freeport, which is part of the water quality limited segment titled the Delta Waterways (northern portion), in Region 5.

Our comments are written in response to both the most recent document developed for the Central Valley Regional Water Quality Control Board (Regional Water Board), and to information presented at the Public Workshop held on April 18, 2007. The document is titled, *Methodology for Derivation of Pesticide Water Quality Criteria for the Protection of Aquatic Life in the Sacramento and San Joaquin River Basins. Phase II: Methodology Development and Derivation of Chlorpyrifos Criteria.* This report was prepared by staff at the University of California, Davis, (UC Davis) and is dated December 2006.

Data Selection and Evaluation for Water Quality Criteria Development

The proposed criteria development process includes detailed guidelines for collection and review of the toxicity data. This appears generally to be reasonable and well-thought out. Overall, it provides for a structured and objective process to evaluate the data that are used in the criteria development. However, some elements of the evaluation will exclude data that were previously considered adequate for criteria development by USEPA (as demonstrated by the chlorpyrifos example), and are useful in establishing the toxicity distribution. This will generally result in fewer data being used that would shift the extrapolation at the sensitive end of the toxicity distribution, which could result in the development of a criteria that could be artificially lower and may be difficult for dischargers to comply with.

Criteria Derivation Methodology

There are a number of technical problems with the Criteria Derivation procedure that should be addressed before applying the process to other pesticides. These are of additional concern because of the potential for the Regional Water Board to use this same methodology to generate new criteria for non-pesticide parameters. There is nothing specific to pesticides in the criteria derivation procedure, and based on the proposed method, new criteria derived with this method can be expected to result in artificially lower criteria much more often than not. When the potential for application of arbitrary safety factors (assessment factors or AFs) is combined with the relatively small amount of data available for most newer pesticides, it is very likely that the proposed criteria development process will generate some very low and inappropriate pesticide criteria. Similarly, the provisions in the proposed method would result in lowered values for many other parameters which the Regional Water Board may subsequently attempt to apply by replacing well-established criteria, or through interpretation of narrative criteria already in the Basin Plan.

Much of the actual criteria derivation is consistent with the USEPA methodology. However there are a number of problematic deviations from the USEPA methodology that compromise the technical and scientific validity of the proposed criteria derivation method. Specific technical issues are discussed below.

1. The proposed method explicitly provides procedures for derivation of criteria based on insufficient data. It accomplishes this by requiring the use of arbitrary AFs to generate criteria for toxicity data sets with results for only one to five species. The problem of the lack of a valid scientific basis for specific AFs is trivial compared to the problem of generating criteria with insufficient data. Fewer than 4 toxicity values simply isn't a valid basis to derive a scientifically defensible criterion. EPA's minimum of 8 Genus Mean Acute Values (GMAV) or Species Mean Acute Values (SMAV) in this case, is a more reasonable amount of data – although still not adequate for accurate definition of the overall distribution. It was suggested by Regional Water Board staff at the April 18, 2007 workshop that the low data requirement threshold (one value) serves to motivate regulated entities (e.g., pesticide registrants and permittees) to generate additional data to avoid the AFs and overly-stringent criteria. This is both inappropriate and not an adequate scientific rationale for deriving criteria based on insufficient data.
2. The proposed procedure allows use of the Species Sensitivity Distribution (SSD) method to generate criteria for pesticide data sets with as few as 5 species. Again, this is not enough data to adequately characterize a distribution and is both inappropriate and not an adequate scientific rationale for deriving criteria
3. The proposed procedure uses a Burr III-type distribution for the SSD and uses the entire distribution to estimate the 5^{th} percentile (instead of focusing on the most sensitive species). In contrast to the USEPA method, this allows greater influence on the criteria by relatively insensitive species, and requires the data set to conform to the underlying distribution assumption. The Burr III distribution's behavior should be evaluated to determine its performance with small data sets, and the potential effects on criteria of outliers and censored data. Although the Burr III family of distributions is fairly robust, this assumption requires a unimodal distribution without outliers to correctly estimate the 5th percentile. The derivation method would be improved by focusing on the sensitive end of the sensitivity distribution.

4. In responses to Regional Water Board staff comments, the UC Davis authors state… "*The USEPA method works reasonably well despite violations of distributional assumptions because the method ultimately focuses on just the four values nearest the 5th percentile, thus often disregarding a large body of available data*". This is not a correct characterization. The USEPA method uses all of the data in the distribution to establish the probabilities of the distribution. It also recognizes that results for insensitive species have little relevance and should have little influence on estimating criteria to protect sensitive species. The USEPA method also has the advantages of making few assumptions about the underlying distribution and thus avoids potential problems of multimodality and outliers in the data set. In many ways, it is a more flexible and robust method than using the Burr III distribution, and should be reconsidered.

5. The proposed methodology would result in unnecessary reduction in data set size, increased extrapolation and uncertainty, and consequently overly stringent criteria. This potential problem can and should be addressed by the USEPA method of estimating the 5th percentile value using only the sensitive end of the toxicity distribution.

6. The proposed method also treats potential outliers and bimodal distributions inappropriately by excluding data from the dataset without accounting for them in the probability distribution. This also results in unnecessary reduction of the size of the data set, and consequently increases extrapolation and uncertainty in estimating the desired level of protection. This will result in unnecessarily stringent criteria. This deficiency in the proposed method can also be addressed by the USEPA method of estimating the 5th percentile value using only the sensitive end of the toxicity distribution. The USEPA method can also be combined with the Burr III distribution fitting method now proposed by the authors.

7. The SSD procedure should also be refined to allow inclusion or consideration of results that may not meet all of the current data evaluation quality criteria. These data often provide enough information to include the result in the overall distribution of toxicity results. The current evaluation process too hastily excludes results that can contribute value to the overall distribution. Exclusion of useful results without adjusting the probability distribution will lower the criteria unnecessarily. This deficiency in the method should be addressed by modifying the SSD procedure to accommodate censored data (e.g., an indeterminate SMAV that is greater than a specific concentration) that doesn't overly influence the lower (sensitive) end of the distribution. This can be accomplished through use of well-established "Regression on Order Statistics" (ROS) statistical estimation methods.

8. The use and basis of a default Acute to Chronic Ratio (ACR) of 12.4 when there are insufficient pesticide-specific ACR data is not valid. The basis for using an 80th percentile default ACR value is not adequately supported, and in their Phase I report (2006) the UC Davis authors concluded that there is no evidence that any default ACR value is appropriate for pesticides. They subsequently offer the rationale in this report that an ACR is needed to calculate a chronic criterion and that "*...The 80th percentile of values is used in the Great Lakes methodology (USEPA 2003) and that is why it was selected for the new methodology.*" There is no rationale provided for using an 80th percentile value. If there are insufficient data to generate a valid pesticide-specific ACR, sufficient data should be generated instead of using a simplistic and scientifically invalid default value.

Thank you for the opportunity to comment on this issue. Please contact Jerry Troyan at (916) 876-6077 if you have any questions regarding this matter.

Sincerely,

Wendell H. Kido
District Manager

cc: Pamela Creedon, Executive Officer, Central Valley Regional Water Board
Joe Karkoski, Central Valley Regional Water Board
Mary Snyder, SRCSD